

Claims

[c1] 1. A method for a deposition of a thin film using a plasma enhanced chemical vapor deposition process, applicable in the deposition of the thin film on a substrate placed in a chamber, comprising:

- performing the plasma enhanced chemical vapor deposition process to form the thin film on the substrate;
- removing the substrate from the chamber;
- performing a cleaning process
- performing a pre-deposition process;
- performing a discharge plasma treatment;
- loading another batch of substrate into the chamber; and
- repeating step a. to step f.

[c2] 2. The method of claim 1, wherein performing the cleaning process includes passing a cleaning gas into the chamber.

[c3] 3. The method of claim 2, wherein passing the cleaning gas into the chamber includes passing a fluorine-based cleaning gas.

[c4] 4. The method of claim 3, wherein passing the fluorine-based cleaning gas includes passing a NF_3 gas.

[c5] 5. The method of claim 1, wherein depositing the thin film includes depositing an insulation material layer.

[c6] 6. The method of claim 5, wherein depositing the thin film includes depositing a high resistance thin film.

[c7] 7. The method of claim 6, wherein depositing the high resistance thin film includes depositing intrinsic amorphous silicon.

[c8] 8. The method of claim 1, wherein a gas used in the discharge plasma treatment includes a hydrogen gas.

[c9] 9. The method of claim 8, wherein a gas used in the discharge plasma treatment includes a nitrogen gas.

- [c10] 10. The method of claim 1, wherein a gas used in the discharge plasma treatment includes an argon gas.
- [c11] 11. The method of claim 1, wherein a gas used in the discharge plasma treatment includes a helium gas.
- [c12] 12. The method of claim 1, wherein a gas used in the discharge plasma treatment is selected from the group of gas mixture consisting of a hydrogen gas, a nitrogen gas, an argon gas and a helium gas.
- [c13] 13. A method for a thin film deposition using a plasma enhanced chemical vapor deposition (PECVD) process, comprising:
 - performing a plasma enhanced chemical vapor deposition (PECVD) in a chamber to form a thin film on a first batch of substrate;
 - removing the first batch of substrate from the chamber;
 - performing a cleaning process on the chamber;
 - performing a pre-deposition process on the chamber;
 - performing a discharge plasma treatment of the chamber;
 - placing a second batch of substrate into the chamber; and
 - performing the plasma enhanced chemical vapor deposition to form the thin film on the second batch of substrate.
- [c14] 14. The method of claim 13, wherein performing the cleaning process includes passing a cleaning gas into the chamber.
- [c15] 15. The method of claim 14, wherein passing the cleaning gas into the chamber includes passing a fluorine-based cleaning gas.
- [c16] 16. The method of claim 15, wherein passing the fluorine-based cleaning gas includes passing a NF₃ gas.
- [c17] 17. The method of claim 13, wherein to form the thin film includes to form an insulation material layer.
- [c18] 18. The method of claim 13, wherein to form the thin film includes to form a high resistance thin film.

- [c19] 19. The method of claim 18, wherein to form the high resistance thin film includes to form intrinsic amorphous silicon.
- [c20] 20. The method of claim 13, wherein a gas used in the discharge plasma treatment is selected from the group of gas mixtures consisting of a hydrogen gas, a nitrogen gas, an argon gas and a helium gas.